RIELLO ELETTRONICA

riello ups

TECHNICAL SPECIFICATIONS

DIALOG PLUS

700-3000VA SINGLE-PHASE
On line double conversion (VFI) technology

Table of contents

..1.. OBJECTIVE 3

..2.. DESCRIPTION OF THE SYSTEM 3

..3.. APPLICATIONS 4

..4.. CHARACTERISTICS 4

..5.. NORMATIVE REFERENCES 7

> 5.1 Main reference standards 7
> 5.2 Standards relating to systems and installation 8

..6.. SUPPLIED EQUIPMENTS AND ACCESSORIES 9

> 6.1 Tower version 9
> 6.2 Rack version 10

..7.. BLOCK DIAGRAM 11

> 7.1 Block diagram of the UPS 11
> 7.2 Options 11

..8.. INTERFACING 15

> 8.1 Serial communication port 15
> 8.2 Communication software 16
> 8.3 Configuration software 18

..9.. OPTIONS 19

> 9.1 Summary table of the options available 19
> 9.2 Installation of the battery expansion module 19
> > 9.2.1 Configuration of the battery expansion module 19

..10.. FRONT PANEL 20

> 10.1 Display panel 20
> 10.2 Description of the display panel icons 20
> 10.3 UPS front view 23

..11.. REAR PANEL 24

> 11.1 Rear panel 700 – 2000 VA Models 24
> 11.2 Rear panel 2000ER – 3000/3000ER VA Models 25

..12.. TECHNICAL DATA 26

> 12.1 Tower models 26
> 12.2 Back-up expansion modules for tower version 26
> 12.3 Summary data sheets 27

..13.. DIALOG PLUS RACK 31

> 13.1 Rack models 31
> 13.2 Back-up expansion modules for rack version 32
> 13.3 Rear panel view 32

1 - OBJECTIVE

This technical document has been produced to be used by UPS system designers and installers.
The objective of this document is to provide and illustrate:

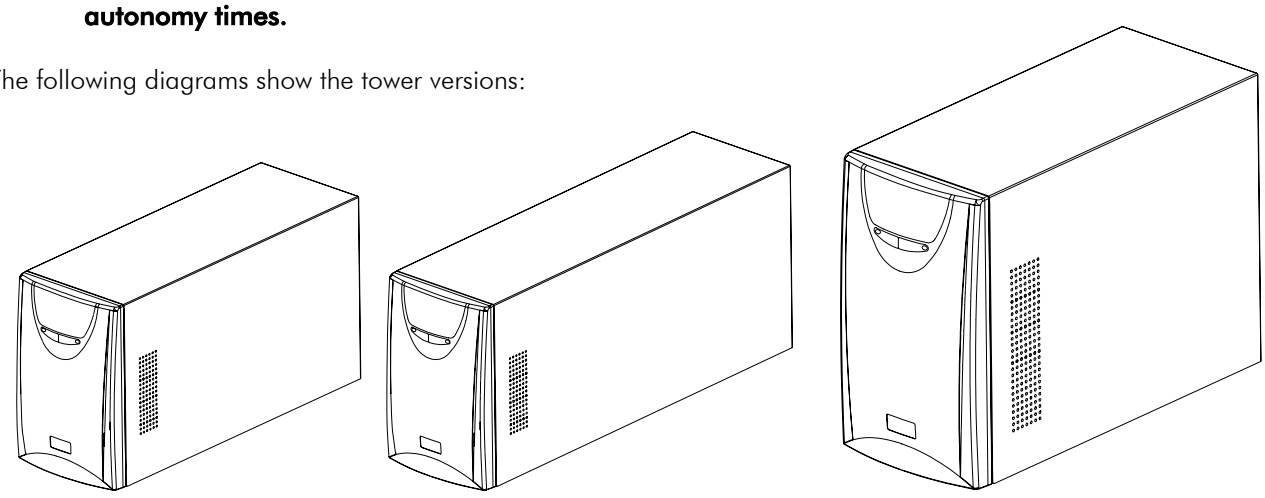
. the technical information required to enable you to choose the correct UPS to suit your needs
. the information required to set up and configure the system
. the information concerning the installation and location of the UPS
. the information the UPS displays locally to the user or to the monitoring systems it is connected to (e.g. control centres, etc.)
. a list of the possible options available to configure the UPS to the operators specific requirements

2 - DESCRIPTION OF THE SYSTEM

The new **Dialog Plus** range of UPS has been designed to offer a high level of versatility and reliability.
Utilising the latest ON LINE technology, meaning that the alternating current (AC) supplied to the load, is first converted to direct current (DC) and then back to AC again to ensure a perfectly sinusoidal output, the frequency and voltage are constantly monitored using microprocessor digital control, this control ensures true independence of the input power supply. The Dialog Plus range of UPS is also supplied with an automatic by-pass system; the bypass system can instantly switch the load on to the incoming power supply in the event of any unforeseen overvoltages, overloads or any other power or load related problems, and therefore a continuous power supply even during the most critical conditions is guaranteed.
The Dialog Plus range of UPS is available in two formats, tower or 19" rack mount, both of which are available as either:

- **Standard: with batteries located inside of the UPS**
- **ER: without any batteries located inside the UPS, but including a powerful battery charger (max 8A). This version can only be used in combination with an external battery box, for long autonomy times.**

The following diagrams show the tower versions:



Tower version

MODEL		Dialog Plus 70	Dialog Plus 100/100ER	Dialog Plus 150	Dialog Plus 200/200ER	Dialog Plus 300/300ER
Nominal power	**[VA]**	700	1000	1500	2000	3000
Nominal output voltage	[Vac]	220/230/240				
Dimensions HxWxD	[mm]	236x158x400	236x158x400	236x158x500	348x192x460	348x192x460
Weight	[Kg]	12	14/8	19	34/14	35/14

Rack version

MODEL		Dialog Plus rack 70	Dialog Plus rack 100 / 100 ER	Dialog Plus rack 150	Dialog Plus rack 220 / 220 ER	Dialog Plus rack 300 / 300 ER
Nominal power	**[VA]**	700	1000	1500	2200	3000
Nominal output voltage	**[Vac]**	220 / 230 / 240				
Dimensions WxDxH (1)	**[mm]**	483x390x88	483x390x88	483x480x88	483x480x176 / 483x480x88	483x480x176 / 483x480x88
Weight	**[Kg]**	13	16 / 9	21	38 / 13	39 / 14

(1) Note: 88mm = 2U; 176mm = 4U (2U + 2U); 483mm = 19"

3 - APPLICATIONS

=> Personal computers
=> Small IT networks
=> Local Area Networks (LAN)
=> Workstations
=> Servers
=> Point of sale (POS) systems
=> Data centres
=> Industrial PLC's
=> Cash registers
=> Electrical medical equipment
=> Emergency devices (lights/alarms)

4 - CHARACTERISTICS

The system provides a stable and reliable voltage (On Line double conversion VFI technology in accordance with European standard IEC62040-3) with filters for suppressing atmospheric and mains borne disturbances.
The On Line technology provides the maximum protection for the connected loads. The double conversion stage filters and stabilises the input voltage, and then reproduces it free of any disturbances such as overvoltages, variations in frequency and voltage, noise, etc.
The IEC62040-3 standard defines this technology as VFI (Voltage and Frequency Independent), meaning that the output voltage and frequency are completely independent of any variations or disturbances caused to the incoming mains supply.

High level of reliability, versatility and easy maintenance

- **High level of reliability (total microprocessor control):**

  The digital control system dramatically improves the overall reliability and efficiency of the UPS; resulting in a reduction in the number of electronic components required, the microprocessor controls and monitors all of the functions of the UPS from one common control card. The control card can be used across a number of various systems, even systems in different ranges, thereby increasing the productivity and reliability of the range.

- **High overload capacity:**

  The UPS can supply overloads up to 150% during mains supply or battery operation.

- **Programmable timer:**

  This function enables the user to program the timer to automatically switch the system on or off at specific times (configurable via the software).

- **Stand by:**

  During Stand-by function the inverter is switched off and the batteries are charged. The stand-by function is automatically activated when the UPS is switched off.

- **Frequency auto selection:**

  The UPS can be configured to automatically select the output frequency (50 or 60Hz), by using the input frequency as its reference (50 or 60Hz).

- **Battery start-up (cold start):**

  The UPS can be switched on even when no incoming mains supply is available.

- **Auto restart:**

  Following a mains supply failure, once the UPS has shutdown upon reaching the end of its designed battery autonomy time, the system can be configured to automatically restart once the incoming mains supply returns (configurable via the software).

- **GS/TÜV certified:**

  The Dialog Plus range has been tested and approved by the official certification agency GS/TÜV which guarantees the products performance and reliability.

- **Network, phone and computer protection:**

  The UPS provides overvoltage protection via the RJ11 and RJ45 connectors.

- **Re-settable input protection:**

  The UPS input is connected via a re-settable fuse to protect against overloads or short circuits.

Low consumption

- **Low impact on the mains power supply (sinusoidal absorption):**

  The input current absorbed by the UPS from the mains supply is sinusoidal. This means that the system has a very low impact on the incoming mains supply network, and as a consequence, on the other electrical devices that are connected to it.

- **Load power factor correction (UPS input power factor close to 1):**

  The UPS absorbs power from the incoming mains supply with a power factor close to 1, even if the systems supplied by the UPS have a power factor inferior to this. For example, if the UPS supplies a piece of IT equipment with an input power factor of 0.65, the UPS input power factor will still remain close to 1, ensuring that any mains supply power factor correction banks are not overloaded.

Battery optimisation

– **High level of battery reliability (automatic battery test):**

The UPS carries out battery tests automatically; these tests enable the system to periodically check the efficiency of the batteries in order to prevent any faults occurring to them. The test does not in any way compromise the supply to the connected equipment, and given the short duration (seconds), it does not affect the life or the back-up time of the batteries.

– **Wide input voltage tolerances:**

without any use of the batteries.

– **Up to 120Ah back-up time expandability:**

This is possible using additional external battery packs in combination with the ER version of UPS, which includes an improved and upgraded battery charger.

Compact dimensions

– **One of the smallest on the market:**

Thanks to:
– microprocessor control
– IGBT technology
– internal batteries
– ventilation, front to rear which eliminates the need for any clearance down either side of the unit.

Reduced noise (<40db(A))

Due to:
– use of high frequency IGBT technology
– innovations in the design of the magnetic parts.

Advanced Communication

– **Operational parameters selection via the software**

Using the free software supplied with the system, it is possible to configure the UPS operating parameters to suit the environment in which it is to be installed and operated (see page 18).

– **Monitoring and shutdown software included**

Powershield² provides an efficient and intuitive system for controlling and monitoring the UPS, displaying all of the most important information, such as input voltage, applied load, battery capacity, etc. using a series of bar charts.

The software is able to provide detailed information even if the UPS has malfunctioned, enabling the user to find out why the fault has occurred and when.

Powershield² has been developed using a client/server architecture that renders it flexible and easy to use, with multilingual support and on line help.

The Powershield² software is provided free of charge with an SNMP agent, this version will operate on

Windows 95, 98, 2000, Windows 2003 Server, Me, Xp, NT4.0, Novell, Mac OS, Mac Osx, Mac Os 9.x & Linux operating systems.

The software enables the user to programme the automatic start-up and shutdown of the system on a weekly basis.

The UPS also contains the following hardware interfaces:

– RS232 serial port
– signals interface
– slot for the installation of various adaptors

5 - NORMATIVE REFERENCES

> 5.1 Main reference standards

The company quality system has been certified as conforming to ISO 9001 (Certificate No. CERT-04674-99-AQ-VEN-SINCERT). This covers all of the procedures, operating methods and controls from the design stage to production, sales, through to the after sales service support.

This certification guarantees the following aspects to our customers:

– the use of quality materials
– rigorous standards in production and testing
– receptiveness and openness to our customers
– constant support of all our customers

As well as conforming to this certification, the company also produces "state of the art" products, as dictated by the requirements of the standards quoted below.

The advances that have taken place in Information Technology systems, means that the power systems used to power them must be able to provide an absolutely precise, and even more importantly, absolutely reliable source of power. The standards produced by IEC/CENELEC in the IEC/EN62040 and EN50091 series, cover all aspects of the product: safety, electromagnetic compatibility and performance. In more detail, this series is divided into the following individual standards:

EN62040-1:
Uninterruptible power supply systems (UPS): general provisions and safety provisions

EN62040-1-1:
Uninterruptible power supply systems (UPS): general provisions and safety provisions used in areas accessible to the operator

EN60950 (CEI74-2):
ITE (Information Technology Equipment) safety

EN50091-2:
Uninterruptible power supply systems (UPS): electromagnetic compatibility provisions.

EN50081-2:
Electromagnetic compatibility (immunity)

IEC1000-4-2:
Immunity: Electro Static Discharge (ESD)

IEC1000-4-3:
Immunity: electromagnetic fields

IEC1000-4-4:
Immunity: transient overvoltages (BURST)

IEC1000-4-5:
Immunity: current surges (Surge)

IEC61000-4-11:
Low frequency disturbances

EN50141:
Induced radio interference

EN55022:
Radio frequency disturbance

ENV62040-3
Uninterruptible power supply systems (UPS): performance provisions and test procedures.

IEC146 (CEI22):
Semiconductor electronic converters

IEC529 (CEI70-1):
Degree of protection of casings

European Directives

73/23
Low voltage directive enforcing the obligatory CE marking from 1/1/97. This directive concerns all safety issues associated with the equipment.

89/336
Electromagnetic compatibility directive enforcing the obligatory CE marking from 1/1/96.This directive concerns all issues of immunity and emissions relating to the UPS at its place of installation.

> 5.2 Standards relating to systems and installation

The above product regulations refer specifically to uninterruptible power supply systems. It is these regulations that manufacturers of uninterruptible power supply systems are obliged to adhere to. However, with regard to the electrical system, the installer must refer to other standards.

These standards are:

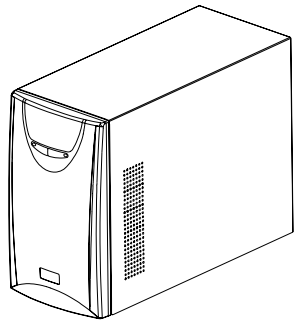
- HD384/IEC60364
  for electrical systems in general
- Standard EN60439-1
  concerning control equipment
- Standard EN50272-2
  for battery installation

6 - SUPPLIED EQUIPMENT AND ACCESSORIES

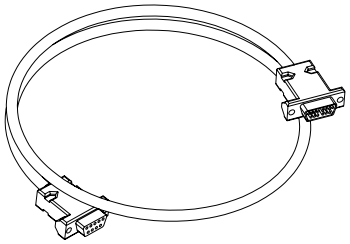
> 6.1 Tower version

The tower-version UPS is supplied together with the following equipments:

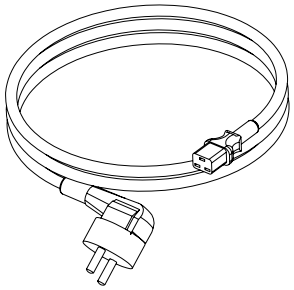
- ❑ UPS



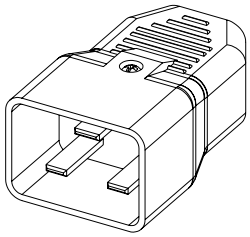
- ❑ RS232 serial cable



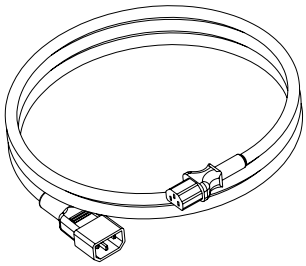
- ❑ IEC 10A(or 16A) Power supply cable



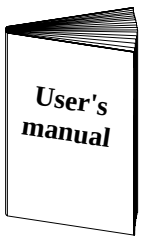
- ❑ IEC 16A loose plug (only for 300/300ER model)

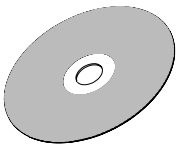


- ❑ 2 IEC 10A connection cables



- ❑ User manual + CD-ROM with software

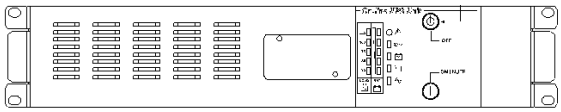




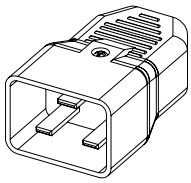
> 6.2 Rack version

The rack-version UPS is supplied together with the following equipments:

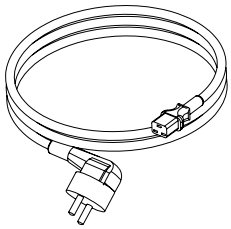
- ❑ UPS



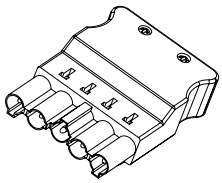
- ❑ IEC 16A loose plug (only for 300 / 300 ER models)



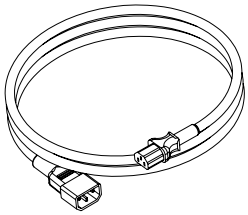
- ❑ IEC 10A (or 16A) power supply cable



- ❑ Battery expansion connector (only for ER models)

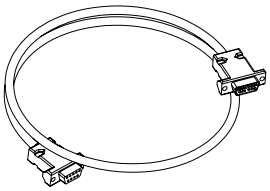


- ❑ 2 IEC-IEC 10A connection cables

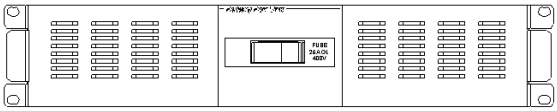


ONLY FOR DIALOG PLUS RACK 220 / 300 MODELS

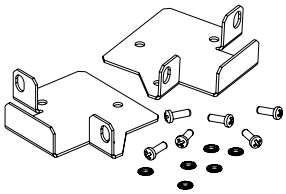
- ❑ RS232 serial cable



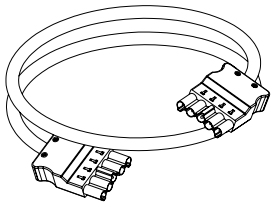
- ❑ BATTERY BOX



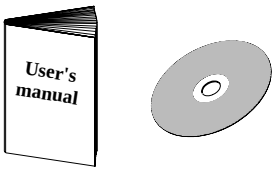
- ❑ handles



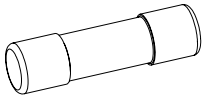
- ❑ Battery expansion cable



- ❑ CD-ROM software + User manual

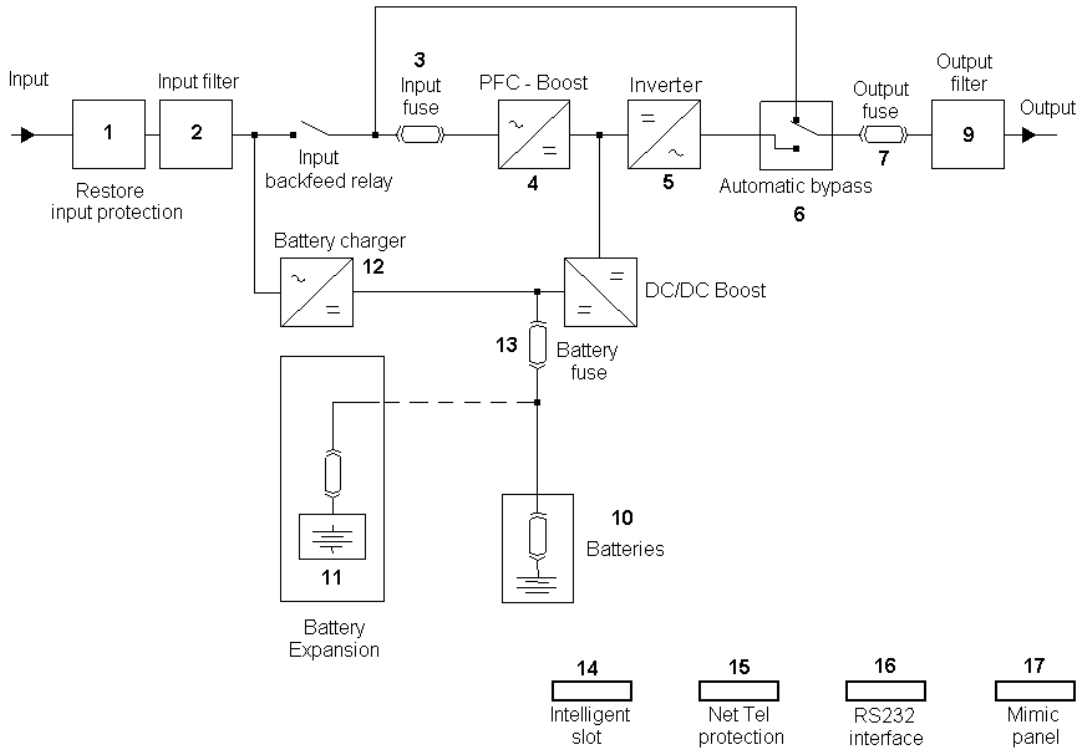


- ❑ Fuse (25A GL)



7 - BLOCK DIAGRAM

> 7.1 Block diagram of the UPS



> 7.2 Options

Isolating transformer	Battery back-up extension	Remote led mimic panel
Net Adapter	USB Converter	Multiplexer

LEGEND:

1) Re-settable input protection

2) Input EMI filter + back-feed protection:
Input filter for protecting the UPS and load against any electromagnetic disturbances.
Back-feed protection: intervenes when the mains power supply fails, therefore isolating the UPS from the input socket to prevent any back feed to the mains power supply. This protection is required to prevent any voltage from returning to the supply, which could put the operator at risk whilst carrying out maintenance work.

3) Rectifier/booster block protection fuse:
This fuse is dependent on the status of the re-settable input fuse (1): a fault occurring to the rectifier/booster will open this protection before the input fuse intervenes, ensuring that the power supply to the connected load is not interrupted, as the by-pass line will remain powered.

4) Rectifier/Booster:
When the mains power supply is present, this converts the mains alternating current (AC) into a direct current (DC) whilst controlling the power factor. If the mains power supply fails, it increases the voltage from the battery to an appropriate voltage level to power the inverter stage.

5) Inverter:
Converts the direct current (DC) into alternating current (AC) to supply the load

6) Automatic by-pass:
Used for switching between the inverter output and the mains supply or vice versa without interrupting the power supply to the load, this activates if any overloads or faults occur.

7) Output switch:
Used To isolate the UPS when carrying out maintenance work.

9) Output EMI filter:
Output filter for protecting the load against any electromagnetic disturbances.

10) Maintenance-free sealed lead acid batteries:
Supplies power to the inverter to support the load when the incoming mains power supply fails.

11) Battery expansion (from 1000 to 3000VA models):
Enables extended battery autonomy for prolonged power outages.

12) Battery charger:
A DC-DC module to recharge the batteries, it is deactivated when the mains power supply fails.

13) Battery protection:
Battery to UPS protection fuses

14) Intelligent slot:
To slot in any auxiliary communication card (accessory cards).

15) Net – Tel protection (on RJ11 and RJ45):
Protection for network or phone connection from any overvoltages.

16) RS232 interface:
Enables monitoring and shut down software connection.

17) Mimic panel:
The mimic panel provides the user with visual (LED) and acoustic (buzzer) signals relating to the status of the UPS. The panel also enables the user to control and send basic commands to the UPS.

Operating modes

"NORMAL" mode

During NORMAL mode, the UPS power is taken from the incoming mains supply, whilst the UPS output (load) is supplied by the inverter (refer to the block diagram), and the batteries are maintained at a fully charged state.

Automatic "BY PASS" mode

The UPS will switch to BYPASS mode in the event of one of the following scenarios:

a) Immediately after the UPS is switched on if the mains power supply is present.
The UPS output is automatically switched onto the by-pass line; therefore the load is temporarily powered by the incoming mains power supply.
This enables the user to exceed the applied load in-rush current without tripping the fuses to the inverter. During the transition, the microprocessor ensures that the inverter output is synchronised in phase with the incoming mains power supply, before the load is switched onto the inverter.

b) If the inverter is permanently overloaded.
The inverter will continue to supply power the load even when there is a temporary overload condition. If this overload condition persists, the inverter protection is tripped and the UPS will switch the load onto the by-pass line, therefore the load will be powered from the incoming mains supply.

c) If the voltage produced by the inverter exceeds the allowable tolerance limits.

d) If the inverter or rectifier/booster malfunctions or fails completely.

"BATTERY" mode

The UPS operates in BATTERY mode when the mains power supply fails (short interruptions or total black-outs). During this mode, the buzzer sounds intermittently:

a) During battery back up (autonomy) mode
b) When the back-up time limit has been reached
Approximately 3 minutes from the end of the back-up time period (configurable via the software), the yellow "battery discharged" LED will illuminate, and if the management software has been installed, the programmed shutdown of the IT applications will begin (if configured to do so).

"Error conditions"

The UPS is designed to function reliably and to automatically guarantee the protection of the connected load. However, particular operating conditions may exist which the operator should be aware of, to ensure that the UPS continues to provide the highest level of protection and performance.

"Overload"

An overload occurs when the connected load requires a level of power higher than that for which the UPS has been designed.
This condition is indicated by the red overload LED located on the load LED bar; also during this condition the buzzer will sound.
To rectify this condition, the user must switch the UPS off (OFF button), reduce the applied load, and switch the UPS back on again (ON button).

"Mains out of tolerance"

The UPS is designed to function with a wide range of input voltages. This ensures that the batteries do not intervene unnecessarily, thus increasing the back-up time should an actual blackout occur.

The microprocessor continuously checks the input voltage and frequency to ensure a high standard of operation and will switch the load onto the by-pass within a wide tolerance range.

"Overtemperature"

If the internal temperature exceeds the acceptable limits, the UPS will protect itself by shutting down. During this situation the "Stop/Stand-by" LED will illuminate and the buzzer will sound continuously.

"Batteries depleted"

The microprocessor carries out a periodic battery efficiency test. If the batteries fail the test, the red "Battery failure" (efficiency < 60%) LED will illuminate. In this condition, the UPS batteries should be replaced accordingly.

8 - INTERFACING

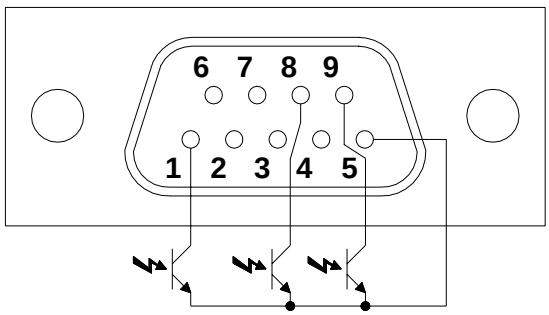
> 8.1 Serial communication port

The UPS has the following communication ports (see UPS views):

- RS232 serial port
- COMMUNICATION SLOT: expansion slot for additional interface cards

RS232 serial port
The RS232 serial port enables the connection of a PC (COM port) by means of a pin-to-pin serial cable (provided[1]).

RS232 CONNECTOR



PIN No.	SIGNAL
1	Contact closed: UPS failure/Bypass/Alarm [2]
2	TXD
3	RXD/SD (remote shutdown) [3]
4	
5	GND
6	+12Vdc interface power input
7	PNP Signal
8	Contact closed: battery low pre-alarm [2]
9	Contact closed: on battery mode [2]

(1) If a different cable is used, it should be a pin-to-pin type with a max length of 3 metres.
(2) Opto-isolated contacts max. +35Vdc / 15mA.
(3) SD: Whilst the UPS is in battery mode, the UPS will perform a complete shutdown when +5-15Vdc is applied between PIN 3 and PIN 5 for at least 20 seconds.

Communication Slot

All Dialog Plus come with an expansion slot for the fitting of optional communication cards so that the unit is compatible with most communication options.

Some examples:

- Serial port duplexer
- Ethernet network agent with TCP/IP, HTTP and SNMP protocols
- RS232 + RS485 port with JBUS / MODBUS protocol

For more details on the options available, visit the manufacturer's web site.

> 8.2 Communication software

MAIN CHARACTERISTICS

1) Sequential and prioritised shutdown:

PowerShield² enables the user to shutdown the network without having to individually switch off each PC or server, and before doing so, Powershield² will save the work that was being done regardless of the application that was being used. The user may also define their own shutdown procedure and also prioritise the shutdown of critical components within the system (such as vital and non vital servers).

2) Multiplatform compatibility:

PowerShield² provides the user with a standard control and monitoring capability, using TCP/IP communication protocol.
This enables the user to monitor computers that use different operating systems from a single console. For example, not only could the user monitor a UNIX server from a PC with Windows 98, the user could also connect to UPS systems situated in different locations by using either a dedicated network (intranet) or the Internet.

3) Events scheduling:

PowerShield² enables the user to define their own shutdown/switch off and on procedures, for the systems that are connected to the UPS. Not only does this noticeably increase the degree of security of the system, it also enables the user to make significant energy savings.

4) Message management:

PowerShield² keeps the user constantly informed of the status of the UPS, whether locally or by sending messages to users connected to the network. It is also possible to create a list of the people who will receive messages by e-mail, fax and SMS should a fault or sudden blackout occur.

5) Integrated SNMP agent:

PowerShield² contains an integrated SNMP agent for managing the UPS via SNMP. This agent is able to send all of the information regarding the UPS and is capable of generating traps using the RFC 1628 MIB standard.
This enables the user to control the UPS using SNMP compatible workstations such as HP Open View, Novell Managewise and IBM NetView.

OPERATING SYSTEMS SUPPPORTED (Powershield² FULL version)

- Windows 95, 98, Me, NT 4.0, Win 2000, Win 2003 Server, XP.
- Novell Netware 3.x, 4.x, 5.x, Intra NetWare
- IBM OS/2 Warp and Server,
- Mac OS, 9.X, OSX
- The most commonly available UNIX systems such as:

IBM AIX, HP UNIX, SUN OS SPARC, SUN Solaris INTEL and SPARC, SCO Unix and UnixWare, Siemens SINIX, Silicon Graphic IRIX, Compaq True64 UNIX and DEC UNIX, Linux, BSD UNIX and FreeBSD UNIX

POWERSHIELD² SOFTWARE FUNCTIONS

1) Graphical monitoring of the UPS status

PowerShield² is the easy to use yet powerful program that enables the user to monitor and control the UPS systems.
There are various graphical versions including Windows, Java, OS/2 and MacOS.

2) MACOS version

The PowerShield² software is the only UPS control and shutdown software available for the Macintosh that has a client-server architecture.
Enabling the user to access the Windows, Novell, IBM OS/2 and the most commonly available UNIX operating systems, when using a TCP/IP network.
It also enables the user to support the NetMan series network agents to control the UPS via a network, and furthermore, comes with multilingual support.

3) Detailed display of all the UPS data

PowerShield² provides all the data required to make an accurate and swift assessment of the UPS operation and status.

4) Block diagram and operational diagram of a UPS

PowerShield² displays a block diagram of the UPS, thus providing the user with conceptual information as to the status of the system.

5) Automatic saving of the events log and graphical display of the most important values

All of the events regarding the operation of the UPS are saved and recorded, thus allowing the user to monitor such data as the input voltage, applied load or the remaining back-up time available from the batteries.

6) Alarm notification via e-mail and SMS

It is possible to configure PowerShield² to automatically notify of an alarm via an e-mail or SMS message.

7) Programming the UPS commands

Enables the user to program all of the commands that would normally be carried out manually, to be performed automatically, for example: shutting down or switching the servers back on, UPS battery test, etc.

> 8.3 Configuration software

Configuration Software

UPSTools software enables the user to configure the UPS, and provides a full view of the system parameters and status through the RS232 serial port.
Refer to the paragraph **UPS Configuration** for a list of the configurable values available.

UPS Configuration

The following table lists all of the possible configurable values available so as to best adapt the UPS to the user requirements. The configuration can only be modified using the UPSTools software provided.

FUNCTION	DESCRIPTION	DEFAULT	POSSIBLE CONFIGURATIONS
Automatic Restart	Automatic restart when the mains power supply returns	Enabled.	• Disabled • Enabled
Battery low alarm	Remaining battery charge level setting for the battery low alarm	3 min.	• 1 – 99 in steps of 1 minute
Output frequency	Enables the user to select the output frequency.	50Hz	• 50Hz • 60Hz • Auto(the UPS will set the output to match the input frequency either 50 or 60 Hz)
Output voltage	Enables the user to select the output voltage	230 Vac	• 220 Vac • 230 Vac • 240 Vac
Bypass voltage threshold	Selects the voltage range accepted for switching over to the bypass	Low: 180V High: 264V	• Low: 180 – 200 in steps of 1V • High: 250 – 264 in steps of 1V
Battery capacity	Enables the user to set the capacity of battery	Standard: 7.2Ah ER: 65Ah	The user must set the capacity of the battery if the actual capacity is different from the default value.

9 - OPTIONS

> 9.1 Summary table of the options available

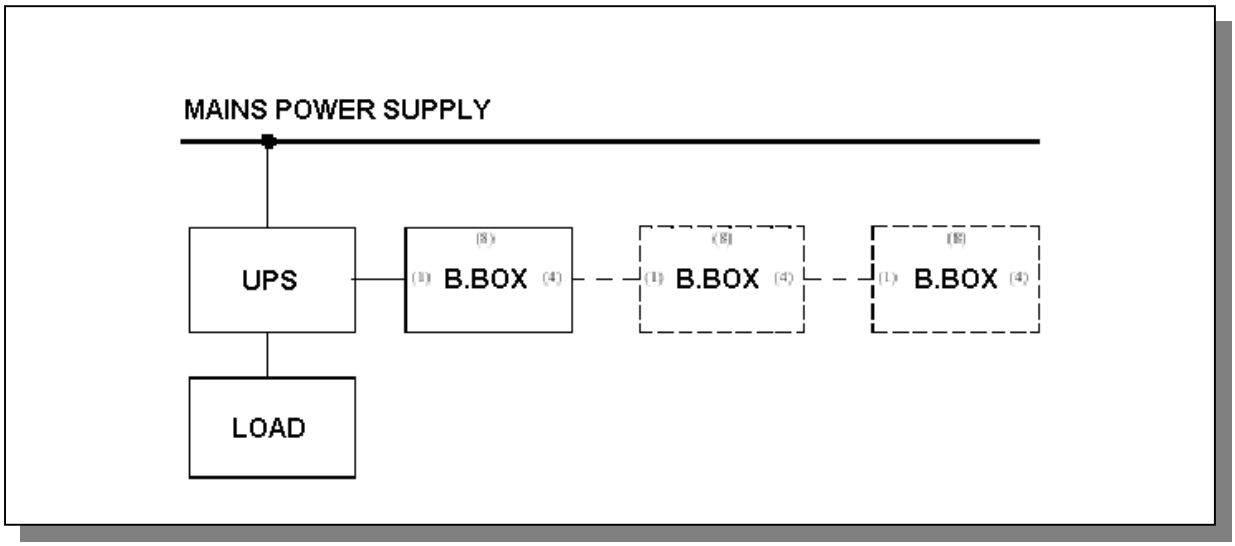
DESCRIPTION	DIMENSIONS (HxWxD mm)	WEIGHT (KG)
Isolating transformer module for DLP 100/DLP 150	480x158x348	22
Isolating transformer module for DLP200/DLP300	480x158x348	30
PowerShield^2 communication software ("full" version)		
Remote display panel with led		

ISOLATING TRANSFORMER MODULE:

Enables the UPS output to be galvanically isolated from the input.
Enables the user to modify the neutral regime (for example, from TT to TN, or from TT to IT) to increase the continuity of the power supply (IT systems) or to increase the level of protection to the users (TN systems).

The transformer may be connected to the input or to the output of the UPS.

> 9.2 Installation of the battery expansion module



> 9.2.1. Configuration of the battery expansion module

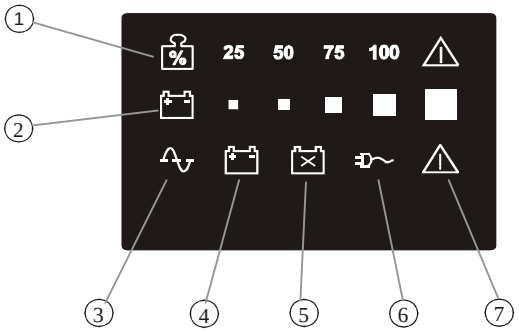
Following the installation of one or more battery expansion modules, the correct total Ah value must be entered into the UPS memory. This may be done by using the UPSTools program, which can be found on the same disc as the UPS management software, once this has been installed correctly.

10 - FRONT PANEL

> 10.1. Display panel

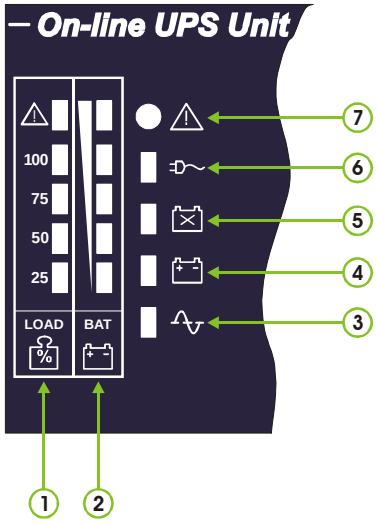
The LED display panel enables the user to check the UPS status and operating mode. It indicates in which mode the UPS is working (on mains, on by-pass, on battery); it shows the load applied; the battery charge level and warns of any error conditions occurring.

Display panel for the Tower and Rack versions



<= TOWER VERSION

RACK VERSION =>



1. Load level indicator
2. Battery level indicator
3. Mains mode indicator
4. Battery mode indicator / Battery low indicator
5. Battery failure indicator
6. Load powered by bypass indicator
7. "Fault/Stand-by" indicator

> 10.2. Description of the display panel icons

Led indicator panel

This section provides a detailed description of all of the LED indicators on the display panel.

ICON	STATUS	DESCRIPTION
⚠	Red / Steady	The UPS has an error or fault
	Red / Flashing	The UPS is in stand-by mode
∿	Green / Steady	The UPS is operating on mains power
	Green / Flashing	▪ The UPS is operating in bypass mode ▪ The input voltage is out of the accepted tolerance

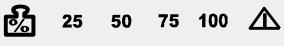
	Green / Steady	The UPS is operating in battery mode and the audible alarm will sound at regular intervals.
	Green / Flashing	When operating from battery power, the UPS will signal that it is about to switch off due to the end of discharge. In this state the alarm will sound at regular intervals of 1 sec (see table 1)
	Red / Steady	Indicates a battery test failure
	Yellow / Steady	The loads connected to the UPS are being supplied by the bypass
	Green / Active	Represents the estimated percentage of battery charge using 5 LED's (see table 2)
		Holding the ON button down for at least 10 seconds will show the input voltage value (see table 3)
	Green – Red / Active	Indicates the % of load applied to the UPS in relation to the nominal value. The last icon indicates overload (see table 4)

Table 1: battery status

Battery status	LED - battery working -
Normal	*
Low	**

* LED illuminated steady
** LED flashing (1 flash per second)

Table 2: battery level

Battery level	Battery LED bar				
	1	2	3	4	5
0%~20%	*				
20%~40%	*	*			
40%~60%	*	*	*		
60%~80%	*	*	*	*	
80%~100%	*	*	*	*	*

Table 3: input voltage

Input Voltage	Battery LED bar				
	1	2	3	4	5
190V~200V	*				
200V~230V	*	*			
230V~250V	*	*	*		
250V~260V	*	*	*	*	
>260V	*	*	*	*	*

Table 4: load level

Load level	Load LED bar				
	25	50	75	100	⚠
0~5%					
5~25%	*				
25%~50%	*	*			
50%~75%	*	*	*		
75%~102%	*	*	*	*	
>102%	*	*	*	*	*

* LED illuminated steady

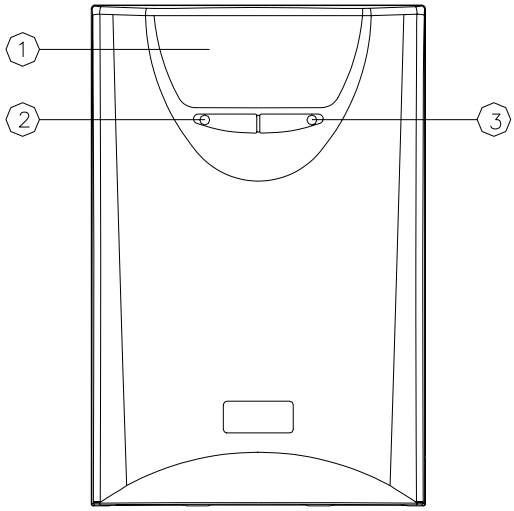
Overloads on the UPS

The following table shows how the UPS reacts when overloads occur during mains or battery operation, and indicates the time that the UPS will continue to supply power to the load.

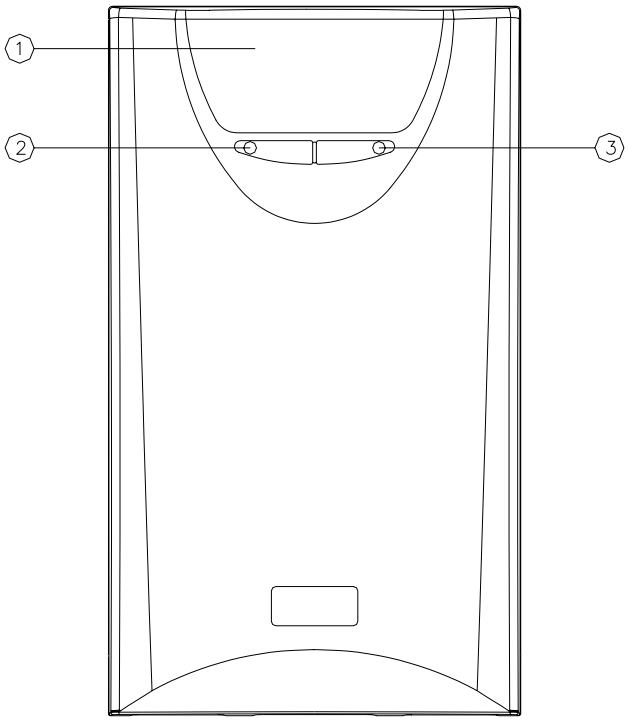
OVERLOAD LEVEL	OVERLOAD TIMES (from mains)	OVERLOAD TIMES (from battery)
102% < Load ≤ 109%	Switches to bypass after 30 min	Shutdown after 30 min (if battery back up time allows)
110% <= Load ≤ 130%	Switches to bypass after 30 sec	Shutdown after 30 sec
130% < Load ≤ 150%	Switches to bypass after 10 sec	Shutdown after 10 sec
Load > 150%	Switches to bypass after 0.5 sec	Shutdown after 0.5 sec

> 10.3 UPS front view

Dialog Plus 700 - 1000 - 1500VA



Dialog Plus 2000 - 3000VA

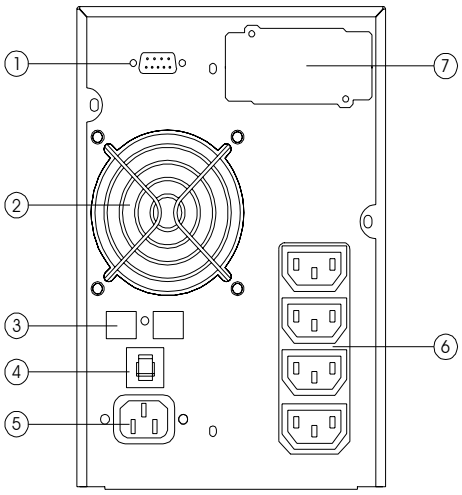


1. LED mimic panel
2. ON button
3. OFF button

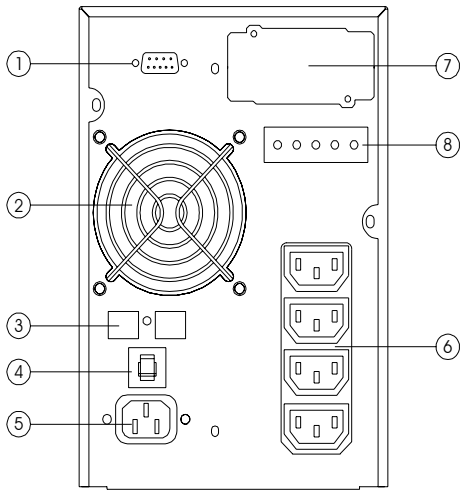
11 - REAR PANEL

> 11.1 Rear panel 700 – 2000 VA Models

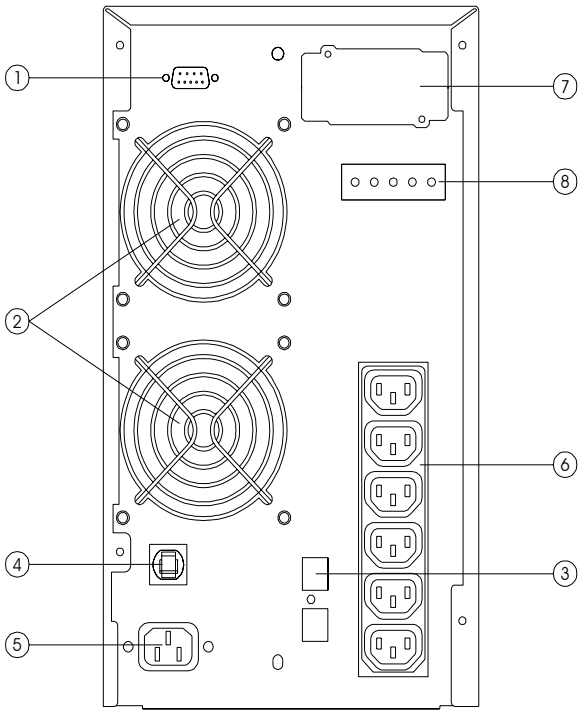
Dialog Plus 700VA



Dialog Plus 1000-1000ER-1500VA



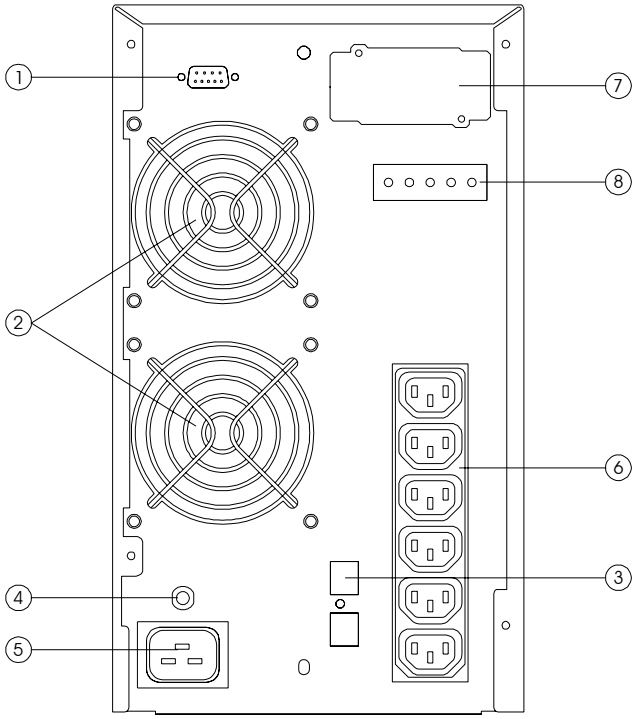
Dialog Plus 2000VA



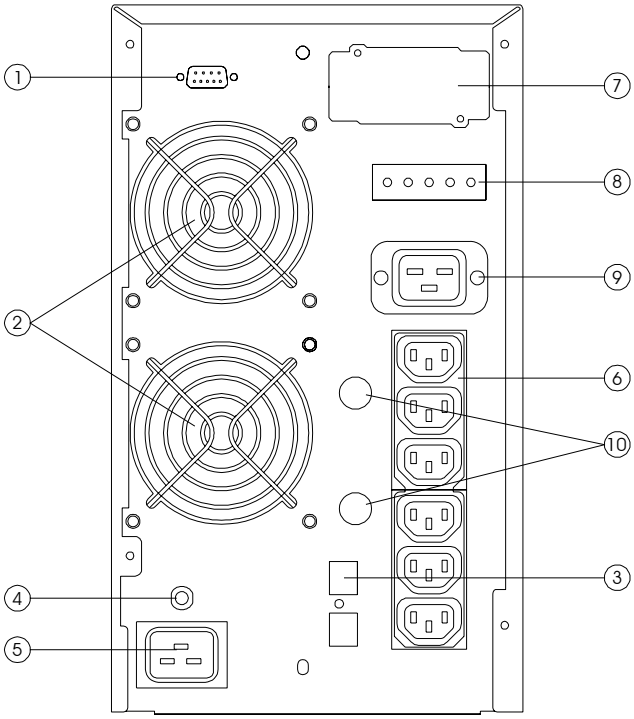
1. RS232 serial communication port
2. Cooling fans
3. Telephone/modem protection/net or intranet
4. Input thermal re-settable protection
5. IEC mains input plug
6. IEC output sockets (max 10A)
7. Communication expansion slot
8. Battery expansion connector

> 11.2 Rear panel 2000ER – 3000/3000ER VA Models

Dialog Plus 2000 ER VA



Dialog Plus 3000 / 3000 ER VA



1. RS232 serial communication port
2. Cooling fans
3. Telephone/modem protection/net or intranet
4. Input thermal re-settable protection
5. IEC mains input plug
6. IEC output sockets (max 10A)
7. Communication expansion slot
8. Battery expansion connector
9. IEC 16A output socket
10. Output socket fuse holders

12 TECHNICAL DATA

> 12.1 Tower models

MODEL	POWER	BACK-UP (min)	DIMENSIONS (HxWxD mm)	WEIGHT (Kg)
Dialog Plus DLP 70	700VA/450W	8 (internal batteries)	236x158x400	12
Dialog Plus DLP 100	1000VA/700W	8 (internal batteries)	236x158x400	14
Dialog Plus DLP 100ER	1000VA/700W	0 (external batteries)	236x158x400	8
Dialog Plus DLP 150	1500VA/1050W	8 (internal batteries)	236x158x500	19
Dialog Plus DLP 200	2000VA/1400W	13 (internal batteries)	348x192x460	34
Dialog Plus DLP 200ER	2000VA/1400W	0 (external batteries)	348x192x460	14
Dialog Plus DLP 300	3000VA/2100W	8 (internal batteries)	348x192x460	35
Dialog Plus DLP 300ER	3000VA/2100W	0 (external batteries)	348x192x460	14

> 12.2 Back-up expansion modules for tower version

For types and back-up times of the Dialog Plus Tower models refer to the Riello Ups's price list.

> 12.3 Summary data sheets

MODEL	700VA	1000VA	1000VA ER	1500VA	2000VA	2000VA ER	3000VA	3000VA ER
INPUT								
Input phases	1							
Rated voltage	220 / 230 / 240 V single phase							
Maximum input voltage before battery intervention	300 V single phase							
Minimum input voltage before battery intervention (applied load 100%)	(110 ± 5) V single phase (load 0% - 60%) (160±5) V single phase (load 80% - 100 %)							
Rated frequency	Standard 50Hz (configurable via the software to 50Hz, 60Hz or auto select)							
Input frequency tolerance	± 5 Hz							
Maximum current	3.8 A	5 A	6.2 A	7.2 A	10 A	13.4 A	14.4 A	16 A
In-rush current	<In							
Power factor	>0.97							
Current distortion (THDi)	< 3 %							
Input protection	Thermal switch 7 A			Thermal switch 10 A	Thermal switch 12 A	Thermal switch 16 A		
"Hold up" time (interruption to the mains supply before battery intervention)	<40ms							
BY-PASS								
Maximum voltage acceptable for switching to the mains supply	264V single phase							
Minimum voltage acceptable for switching to the mains supply	180V single phase							

MODEL	700VA	1000VA	1000VA ER	1500VA	2000VA	2000VA ER	3000VA	3000VA ER
BATTERIES								
Back-up in minutes	8	8	External batteries	8	13	External batteries	8	External batteries
No. Batteries	2	3	External batteries	4	8	External batteries	8	External batteries
Battery nominal voltage	24 V	36 V	External batteries	48 V	96 V	External batteries	96 V	External batteries
Type of battery	7Ah Sealed lead maintenance-free,							
Battery configuration	In series							
Type of recharge	Two voltage levels							
Recharge current	0.9 A							
Recharge time	4hr (typical)							
Intervention time (loss of the mains power supply)	Zero							
Battery ripple current	< 0,01C							
Battery voltage stability (batteries fully charged)	< 0.7 %							
Battery protection	Fuse							
OUTPUT								
Rated voltage	220/230/240 V selectable							
Wave form	Sinewave							
Frequency	(50/60 ± 0.2) Hz selectable							
Frequency converter function	Yes (with batteries)							
Current peak factor (from EN62040-3 regulation)	3:1							
Rated output (VA)	700 VA	1000 VA	1000 VA	1500 VA	2000 VA	2000 VA	3000 VA	3000 VA
Rated output (W)	490 W	700 W	700 W	1050 W	1400 W	1400 W	2100 W	2100 W
Static variation	± 1.5 %							
Dynamic variation (with load impact from 0 to 100%)	≤ 5%							
Output frequency variation supply present (supply lost)	Same as the mains, for variations between ± 5 %							

MODEL	700VA	1000VA	1000VA ER	1500VA	2000VA	2000VA ER	3000VA	3000VA ER
Frequency variation velocity (Hz/sec.)	1 Hz/s							
Voltage reset after dynamic variation	<20 ms							
Voltage distortion (linear load)	<2 %							
Voltage distortion (non-linear load)	<6 %							
OVERLOAD TIMES								
INVERTER OVERLOAD WITH MAINS SUPPLY AVAILABLE								
100%<Load<110%	30 '							
110%<Load<150%	30 ''							
Load > 150%	10 ''							
VARIOUS								
AC/AC efficiency (double conversion operation)	90 %							
Maximum permanent operating temperature	40°C							
Ambient operating temperature	40°C							
Recommended operating temperature (for the batteries)	20/25°C							
Humidity	<95% without condensation							
Protections	Excessive battery discharge – overcurrent – short-circuit – overvoltage – undervoltage - over temperature							
Compliance with safety regulations	EN62040 -1-1 Directives 73/23/EEC and 93/68/EEC							
EMC compliance	EN50091 -2 cl. A, directive 89/336/EEC							
Noise	<40 dB (A) at 1 metre							
DIMENSIONS								
Height (mm)	236	236	236	236	348	348	348	348
Width (mm)	158	158	158	158	192	192	192	192

MODEL	700VA	1000VA	1000VA ER	1500VA	2000VA	2000VA ER	3000VA	3000VA ER
Depth (mm)	400	400	400	500	460	460	460	460
Weight in Kg (with standard back-up integrated batteries)	12	14	8 external batteries	19	34	14 external batteries	35	14 external batteries
Mechanical characteristics	Shielded metal cabinet with an applied plastic front panel display							
Level of protection	IP215							
Resistance to vibrations (G)	<2G							
Power dissipated with load present (W)	49	77	77	115	140	140	210	210
Colour	Metallic grey							
Input differential current	1 mA							
OUTPUT PROTECTION FIGURES (RECOMMENDED VALUES FOR DISCRIMINATION)								
Normal fuses (GI)	In (Rated current)/7							
Normal circuit-breakers (curve C)	In (Rated current)/7							
Ultra-rapid fuses (UR-URG)	In (Rated current)/2							
Cable input	Rear							
Input connections	IEC socket							
Output connections	4 IEC sockets + 1 RS 232 + 1 Net Tel protection + slot				6 IEC sockets + 1 RS 232 + 1 Net Tel protection + slot			
Cooling	Forced ventilation							
Maximum installation altitude	1000m							
Altitude Power derating	10% for every 1000m (above 1000m above sea level)							

13. DIALOG PLUS RACK

> 13.1 Rack models

MODELS	FRONT VIEWS	REAR VIEWS
Dialog Plus Rack DLPR 700 - 1500 VA		
Dialog Plus Rack DLPR 2200 - 3000 VA		
Battery box included for models DLPR 2200 - 3000 VA		

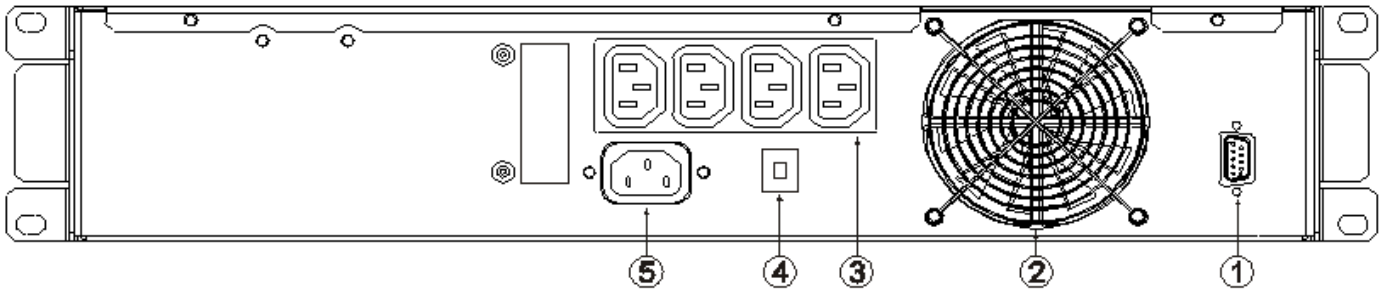
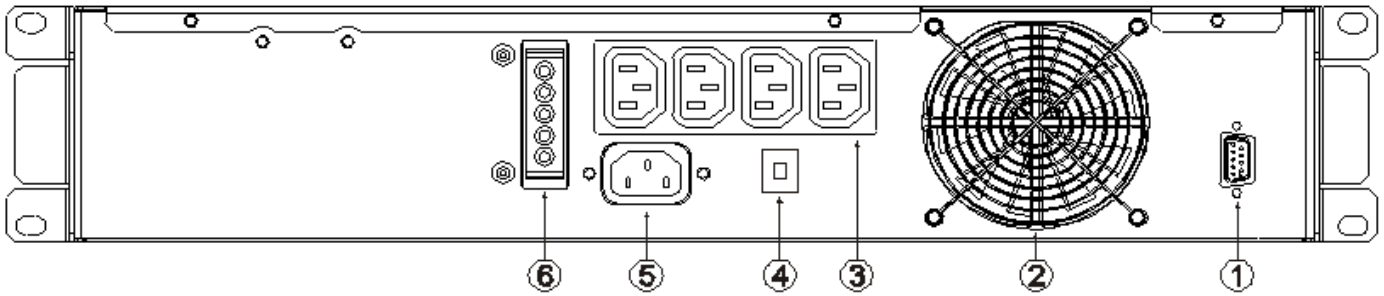
MODELS	POWER	AUTONOMY (min)	(*)DIMENSIONS (HWD mm)	WEIGHT (Kg)
Dialog Plus Rack DLPR 70	700 VA/490 W	8	88x483x390	13
Dialog Plus Rack DLPR 100	1000 VA/700 W	8	88x483x390	16
Dialog Plus Rack DLPR 100 ER	1000 VA/700 W	External batteries	88x483x390	9
Dialog Plus Rack DLPR 150	1500 VA/1050 W	8	88x483x480	21
Dialog Plus Rack DLPR 220	2200 VA/1540 W	12	(88+88)x483x480	11 + 27
Dialog Plus Rack DLPR 220 ER	2200 VA/1540 W	External batteries	88x483x480	13
Dialog Plus Rack DLPR 300	3000 VA/2100 W	8	(88+88)x483x480	12 +27
Dialog Plus Rack DLPR 300 ER	3000 VA/2100 W	External batteries	88x483x480	14

Note: 88mm = 2U; 176mm = 4U (2U + 2U); 483mm = 19"

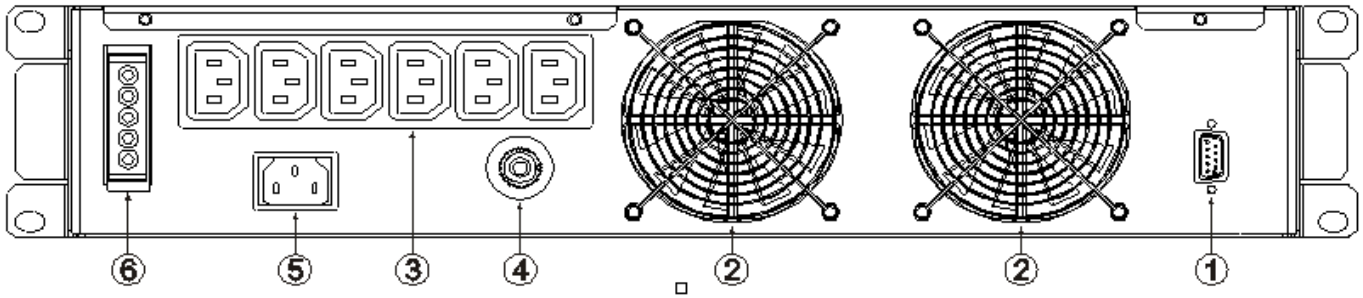
> 13.2 Back-up expansion modules for rack version

For types and back-up times of the Dialog Plus Rack models refer to the Riello Ups's price list.

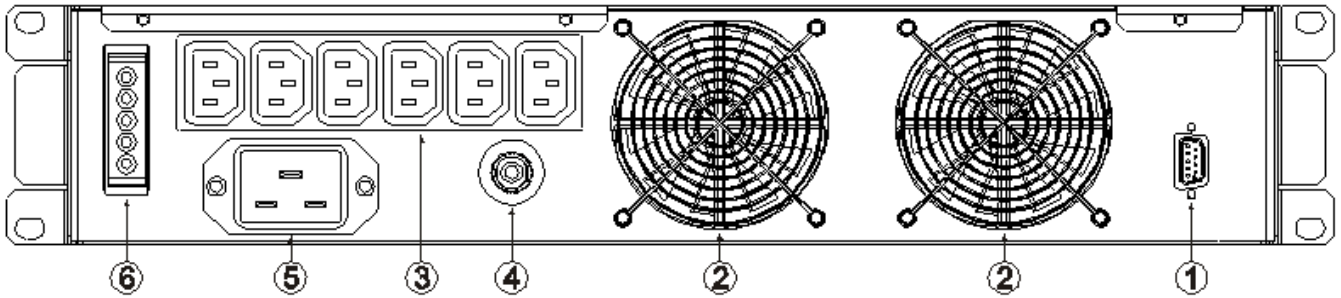
> 13.3 Rear panel view

MODELS	REAR VIEWS
Dialog Plus rack 700VA	
Dialog Plus rack 1000 / 1000 ER VA Dialog Plus rack 1500VA	

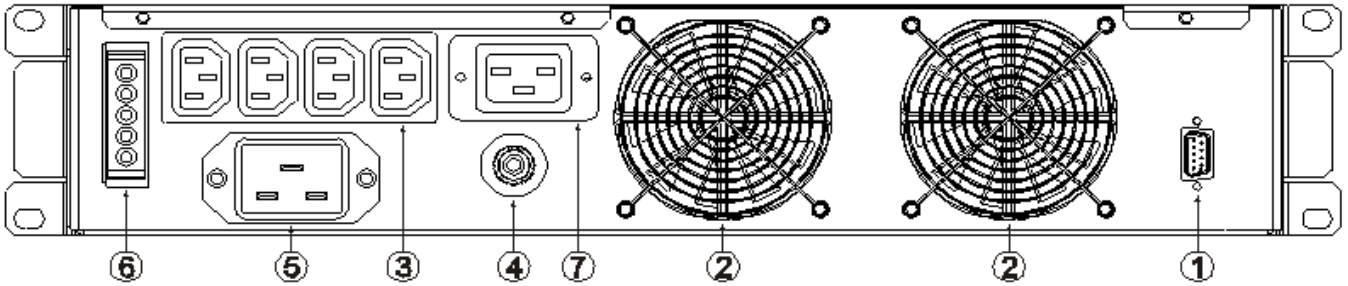
Dialog Plus rack 2200VA



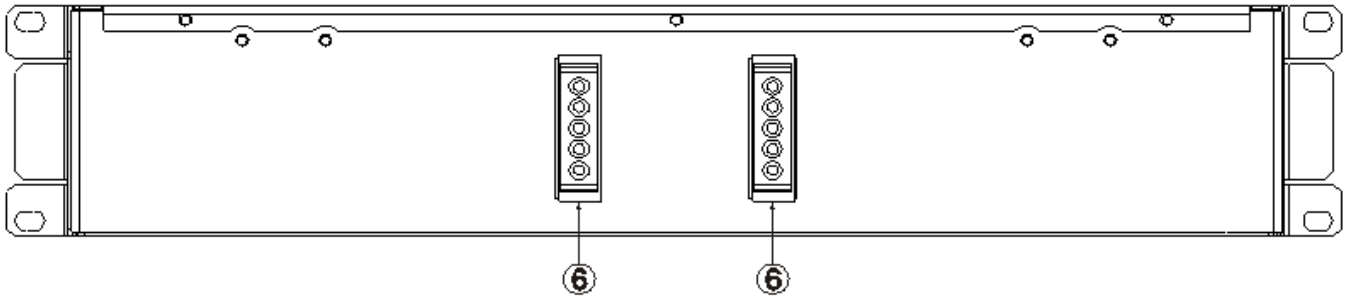
Dialog Plus rack 2200 ER VA



Dialog Plus rack 3000 /
3000 ER VA



Battery Box



1 - RS232 serial communication port
2 - Cooling fans
3 - IEC output sockets (max 10A)
4 - Input thermal re-settable protection
5 - IEC mains input plug
6 - Battery expansion connector
7 - IEC output socket 16A